ON SCENE

THE NATIONAL MARITIME SAR REVIEW

DEPARTMENT OF TRANSPORTATION

U.S. COAST GUARD

ISSUE NO. 1–77

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SUGGESTION FROM A YACHTSMAN

A private yachtsman reported that, while at sea, he heard a Coast Guard Radio Station trying to raise a fishing vessel on 2182 kHz. The yachtsman heard one weak reply to each call. The vessel did not mention that he was in any trouble and seemed to be answering routinely. It was not until the regular Marine Information Broadcast that the yachtsman learned that the vessel was considered overdue. At that time he advised the radio station of what he had heard before. The radio station repeated the call then but the yachtsman did not receive any more signals from the called vessel. The yachtsman felt that the replies he had heard earlier were from the missing vessel because of the instant response to the call sent by the radio station.

The yachtsman suggested that if the Coast Guard would make it a standard practice in the future to mention the fact, before each call of this type, that the vessel being called is overdue or was in trouble it might help in a future situation.

Although, from the record of this case, it is unlikely that the transmission heard by the yachtsman was the missing vessel, his suggestion may have some value. Rather than making it a standard procedure, we are publishing it in this manner for such use as SAR Coordinators may wish to make of it. Comment on the procedure is desired.

A BENEFICIAL SUGGESTION

We recently approved a suggestion for optional use, which may have benefits for SAR boatcrewman, who are inadvertantly thrown into or have to enter the water to render assistance.

The suggestion to improve ability to board or work on smooth surfaces is for the attachment of non-slip patches to the elbows and knees of the wetsuits used by boatcrewman. A material such as is used on the bottoms of the wetsuit boots should prove adequate. If adopted locally, units are requested to comment on their experiences with the idea by letter to the Commandant (G-OSR).

ON SCENE is a SAR publication published by the Commandant, U. S. Coast Guard as a source of information concerning current and proposed procedures as well as new developments in SAR. Articles contained herein are non-record and non-directive.

THE MULTI-AGENCY SAR PLAN: Lake Pontchartrain, LA

By LT T. P. HART, USCG

INTRODUCTION

The purpose of this article is to show how the Eighth Coast Guard District Search and Rescue Branch planned, coordinated, tested, and adopted a search and rescue plan with a multitude of local civilian and federal agencies for a specialized area. From this article, others may be able to gleen sufficient information to formulate a multi-agency SAR plan for needed areas within their geographic area of responsibility. The procedure we used and problems we faced are mentioned herein, and are useful as a guide for formulation of a plan, and a warning for problems to anticipate.

WHY A SAR PLAN FOR LAKE PONTCHARTRAIN?

Lake Pontchartrain, Louisiana is a specialized SAR area; it is widely used by pleasure boats, commercial tugs, and fishermen, and has many structures contained within owned by oil companies, power companies, and other private agencies. Additionally, two airports are on or near the Lake Pontchartrain shoreline with flight paths extending into the lake. The lake measures approximately 32 miles by 26 miles with many tributaries leading in and spilling out from it, and yet the charted maximum depth is only 16 feet (with an undetermineable depth of mud below the lake bottom). No known current charts exist for Lake Pontchartrain due to the large number of factors that would influence the current, including man-made and manually operated spillways that divert water from the Mississippi River through the Lake during high water season.

SAR cases in the past have shown that many agencies have an interest (and feel they have a responsibility) for SAR on the lake, and the need to coordinate these efforts became readily apparent. Since Lake Pontchartrain is considered the navigable waters of the United States, SAR responsibility is placed upon the Coast Guard by Federal Law, and we believed our best interest would be served by assuming a SAR Mission Coordinator's posture and coordinating all search units.

FORMULATION OF THE PLAN

Initial planning and personnel contacts were made from the Search and Rescue office to the 16 non-Coast Guard and 5 Coast Guard organizations (Table 1) that have a SAR commitment or interest in Lake Pontchartrain. Additionally, 18 other agencies (Table 2) were contacted. These could be useful in either providing information during a search, or politically useful in pushing the program during its inception. Simultaneously RCC was planning a workable grid system for search areas in the lake. Backing for a plan was received from members of the Louisiana State Government, and interest in a workable plan was expressed by the Governors Office. Since Louisiana is a highly political State, the "interest" by the Governor assisted greatly in obtaining cooperation from many agencies. No formal agreements were made, (1) because they were deemed unnecessary, and (2) because most agency heads are elected officials, and agreements would not be binding on subsequent elected officials. Public pressure and media interest would serve to insure participation by many of the agencies, and as long as we could make the program both interesting and workable, most of the agencies would desire to participate, without the external pressure being a factor. By taking the initiative and using a positive approach in the program, we were able to obtain a positive response with a minimum of political inter-agency squabbling.

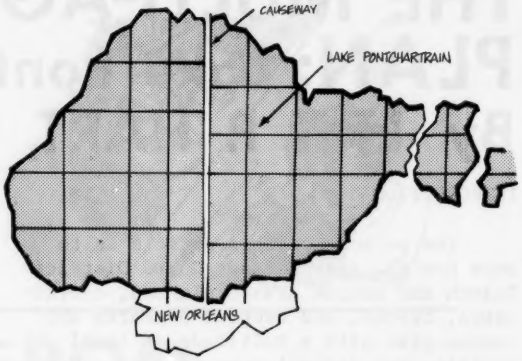
Once initial contacts were made, meetings were held individually with many of the agency heads to discuss the concepts, aims, and capabilities desired in the plan. These meetings were held specifically to promote good will and a cooperative attitude, and laid the groundwork for receipt of necessary information

and a multi-agency meeting in the future.

Once verbal commitments were secured, RCC had to formulate the basic plan that would serve to put verbal concepts into workable form. Questionnaires were mailed to all agencies requesting necessary information on resources available and their capabilities, as well as how to effect call outs of their resources. The compilation of the returned information formed the basis for the RCC Controller's SAR planning.

The next step was to come up with a workable grid system for Lake Pontchartrain. The desired parameter was for the best possible search from the least capable unit, i.e. a small outboard with a magnetic compass. Lake Pontchartrain has an excellent divider and visual reference through the center, the 26 mile causeway, therefore the grid system was divided into 23 East and 18 West grids. The grids were set up using East-West, North-South Magnetic bearings based on visual references in and around the lake. A line of electrical towers in the lake were useful as grid boundaries, and with concurrence and assistance from the local power company, we placed markers on several towers to act as grid corner points and make the specific towers stand out from the other towers as visual references. Other reference points used included bridge spans, light houses, radio towers, and even the tallest building in New Orleans. Although there are imperfections in the grid system, it is a starting point, and continuous evaluation over a period of time in varied conditions will allow for a future refinement to the grids that may improve searches. It is realized that the search units will, for the most part, not be able to conduct perfect search patterns, but by keeping the grids as small as possible, the areas will at least be searched semi-effectively.

Once the grids were designed, and initially evaluated as workable, special charts were printed for distribution to all agencies that had indicated a willingness to assist. Three separate charts were printed, one being a grid chart of the entire lake made up for each agency's base of operations. The other two charts were half-lake grid charts, printed on waterproof paper for use aboard the search units.



A workable communications plan was the next necessity. Many of the units do not carry VHF-FM marine radios, but rather, since many are law enforcement units, carry a low-band FM radio with the individual agency and Statewide law enforcement frequencies. This lack of common frequencies placed the requirement of having five separate communications links in the plan; a VHF-FM control, VHF-FM on scene, low-band FM on scene, VHF aircraft on scene, and a UHF air to surface control frequency. If any unit was unable to contact the On Scene Commander, or relay to the On Scene Commander via another unit, all were instructed to pass information to their home base for relay to the OSC via RCC. At the present time we are attempting to obtain permission for several of our local units to obtain and install a low band FM radio to insure that all units can communicate with the Coast Guard On Scene Commander.

In order to insure effective response within the program in the RCC (as the SAR Mission Coordinator) an SMC folder specifically for Lake Pontchartrain was devised and made immediately available to the controller. The folder consists of contact lists, resources available, an action check off list, a communications plan, and various data forms. All controllers and assistant controllers were then briefed on the use and purpose of the plan. Included in the briefing and incorporated into the plan were a listing of available units to act as OSC (including Navy River Division boats in the area), the concepts of an Aviation Training Center HU16 to act as sub-OSC for aircraft, planned dispatching of controller, assistant controller and/or local group personnel to

act as OSC, and extra miscellaneous equipment available through various sources that can be dispatched to the scene if needed. Once initiated, the folder is continually updated with changes to personnel, telephone numbers, and resources available, thereby insuring a current and workable plan.

A special folder with pertinent information and data forms has also been compiled for the On Scene Commander. This requires the person designated as the OSC to report to RCC on his way to the OSC platform, be briefed on the situation, and obtain a useful packet of information. When time does not permit the OSC to report to RCC first, the packet of information can be sent via another vessel to the OSC.

When all facets of the plan had been developed, a meeting was called with the various agencies involved. This meeting allowed the different agencies to see exactly how much actual interest in the plan was evident, gave the assurance that, not only was the Coast Guard willing to cooperate with agencies, but also desired their assistance, and further showed that the Coast Guard was taking the positive steps towards accomplishment by setting forthe a plan that all could work within. The meeting further provided a forum for all agencies to propose modifications to the plan, and many constructive comments were actually obtained.

At this point we could only hope that the various agency representatives would take the necessary information back to their respective organizations, and insure that necessary personnel were fully indoctrinated in its use. The next logical progression was to test the plan for its overall effectiveness, and ascertain any problem areas that needed revision.

THE SAREX

A multi-agency SAREX was planned for a four hour period spanning both daylight and darkness. All agencies were contacted in advance and requested to participate. Each agency that agreed to participate supplied RCC with a list of units that would be available so that the SMC could effect some preplanning of the exercise. Group New Orleans provided six mannequins (donated by a local department store) as primary SAREX targets, and several small floats as secondary targets. The baic scenario was planned and mailed to the agencies in advance, and was designed to insure a coordinated on scene time for all units. Call out commenced one hour prior to on scene time, and grid assignments were made at that time. The scenario was so constructed as to not allow aircraft to launch immediately upon call out (due to simulated thunderstorms in the area), which gave a single on scene time for air and surface units. The Group New Orleans SAR officer was dispatched aboard CGC PT SPENCER as OSC, and the local Auxiliary Flotilla Captain was also dispatched as an assistant to the OSC. One HU16 from the Aviation Training Center in Mobile was brought over to act as sub-OSC for aircraft coordination. Response included a total of 9 fixed wing aircraft, 4 helicopters, and 38 vessels to search 33 grids. Prior to deployment, notes indicating medical problems were pinned to the mannequins. This extra input for the SAREX was utilized to both elicit response from the search units, as well as add an extra dimension to the workload of the OSC. Within the first 1 1/2 hours, four of the six mannequins were located. Simulated sighting reports were then relayed from RCC to give him indications of the highest probability areas for the remaining mannequins. As darkness approached, all aircraft, with the exception of the Coast Guard helicopter, were released from the search. Prior indications from all agencies was a desire not to fly their aircraft at night, especially under exercise conditions. Most of the pilots were only VFR trained and qualified, and the organizations considered night flying unsafe for the resultant probability of detection. The OSC aboard CGC PT SPENCER, with far superior navigational capability than most of the other vessels searching, gathered several of the other search units together and conducted a PM search pattern using his radar to insure proper spacing. The resultant search pattern was monitored on the LORAN C continuous Plotter being evaluated aboard, and showed a very effective search. The remaining two mannequins were located by the vessels searching in darkness. The floats deployed as secondary search objects proved to be ineffective targets due mainly to the large number of

similar objects used as crab pot markers in the lake. Very few of these were actually recovered.

Five days after the exercise a debriefing was conducted with most of the participants present. Many constructive comments were fielded, and minor problems resolved. The one major problem encountered during the exercise was the constant nemesis of mass search efforts, communications. Various contingencies were suggested, including:

(1) Utilization of a Sheriff's communications platform until the OSC vessel arrives on scene.

(2) Using the Sheriff's van as a relay should communications difficulty arise even when the OSC is on scene.

(3) Divide East and West grid areas into sub-OSC areas, and designate a separate frequency for each area.

(4) Have all agencies with extra portable communications equipment make the equipment available to any search unit that may need a communications set.

FUTURE PLANS

The Lake Pontchartrain SAR Plan will be a usable system provided two important points are acknowledged and acted upon by RCC.

(1) That continuous update of information is necessary to keep the plan current; this includes, but is not limited to, updates of units available, contact lists, and unit capabilities.

(2) That, if no actual SAR is encountered whereby the plan can be put into use, SAREX's must be conducted using the different agencies several times per year. This will insure that any new personnel will be familiar with the plan and will also insure that interest in having a workable plan is maintained. With media coverage of SAREX's, the local community will also be aware that a workable plan is in effect, and the agencies will be more likely to continue participating. By debriefing after each actual case or SAREX, refinements to the plan can be accomplished, and the best possible workable solutions will evolve.

The Lake Pontchartrain SAR Plan can also be used as a basis for setting up a regional disaster plan as recommended after the major airliner crash near Miami or as a basis for callout, coordination and communications should a major disaster occur in the area while no plan is available to insure a coordinated response. It can also be useful as a tool for requesting assistance from participating agencies on minor incidents in which the Coast Guard has insufficient units to respond in a timely manner.

The Lake Pontchartrain SAR Plan as presently in effect took slightly over one year from its inception to the SAREX that tested its capabilities. The need for a workable plan was evident from local interest, and the logical SMC was the Coast Guard. Since the anticipation of a major incident was the basis for the plan, SMC in this case would be RCC, not the local Group Office. Call-out would be the responsibility of RCC as the SMC, and therefore RCC set up the plan. This same type of plan, however, could be set up by a group office or even a station (for a relatively smaller area and case).

For RCC New Orleans, important contacts with, and information on local agencies has been gained through the plan, and a good solid basis for future disaster planning has been established.

TABLE 1

1. Non-Coast Guard

Louisiana Wing, Civil Air Patrol
Jefferson Parish Sheriff's Department
Louisiana Air National Guard
Louisiana State Police
New Orleans Police Department
Orleans Parish Levee Board
St. John the Baptist Sheriff's Dept.

TABLE 1 (Con't)

East St. John Search and Rescue
St. Bernard Parish Sheriff's Dept.
St. Tammany Parish Sheriff's Dept.
St. Charles Parish Sheriff's Dept.
Mandeville Police Department
U.S. Navy Coastal River Division 22
Tangipahoa Parish Sheriff's Dept.
Louisiana Wildlife and Fisheries
Pontchartrain Levee District

2. Coast Guard

USCG Air Station New Orleans
Aviation Training Center Mobile
Group New Orleans
Station New Canal
CGC POINT SPENCER
Coast Guard Auxiliary Division IV

TABLE 2

New Orleans Fire Department
Orleans Parish Coroner
USAF RCC, Scott AFB, Il.
FAA/Aircraft Identification Division
U.S. Army Corps of Engineers
Houston Sector Air Traffic Control
Jefferson Parish Coroner
Lakefront Airport
Louisiana Civil Defense
Mandeville Harbor Master
New Orleans International Airport
Naval Air Station Alvin Callander Field
St. Tammany Parish Coroner
St. John Parish Coroner
Tangipahoa Parish Coroner
U.S. Marines-4th Marines, Gulfport
Louisiana State Aviation Division

A PRACTICE FROM THE 7th COAST GUARD DISTRICT

Editor's Note:

This is another good idea developed by one district and reproduced here from a 7th Coast Guard District letter.

Quality Control of SAR Unit Performance

The program was initiated for some means to be available to keep individual units up-to-date with advancing technology and mindful of procedures involved in day-to-day search and rescue work. The program provides for the personal contact necessary to maintain close liaison between units and RCC.

Normally, one Controller and one Assistant Controller are assigned to a Group area and make periodic visits to the Group Office and other units located within that area. The visits are prearranged with the CO of District units, or the Group Commander and the station CO's and OinC's. Between visits the Controller and Assistant review the SAR case files of cases handled by those units assigned to them so they may develop a feel for problems, and be informed and able to discuss specific questions. Discussion involve units training program, taking care not to interfere with the OinC or CO's training relationship with personnel. Some items which generally warrant comment are:

Preparation of SITREPS for format, content, completeness, timeliness;

Reactions to different incidents and notification procedures;

When to call the Group, RCC, police, etc.;

Whom to call for guidance and/or support when details become unfamiliar or sensitive;

Record keeping (msg files, phone sheets, notes for case follow-up);

Attitude.

Upon return from a visit the "quality control team" files a trip report, a copy of which is forwarded to all individuals in (osr).

OBTAINING DRIFT FROM DATUM MARKER BUOYS UNDER POOR NAVIGATIONAL CONDITIONS

Editors Note: *The following procedure was developed and suggested by LT J. R. Frost when he was an RCC Controller at San Juan. He states that it has been used in the San Juan SAR Sector with phenomenal success.*

Generally there is no standard method for determining the navigational accuracy of an aircraft which has been searching for a long period of time (greater than 30 minutes) without having been able to get a fix (this does not consider the special case of an aircraft equipped with an inertial navigation system) or of obtaining useful datum marker buoy (DMB) current information. While little can be done to improve aircraft navigation under such adverse conditions, a great deal can be done to make the Rescue Coordination Center (RCC) aware of the magnitude of the navigational error of each day's activity and to obtain reliable position information on deployed DMBs.

CORRECTED DMB POSITIONS AND PERCENTAGE NAVIGATION ERROR

If the dead reckoning (DR) position and the actual position of the aircraft are both determinable for the end of the day's activities, then the vector displacement of the fix from the DR position can be applied to the DR position of the DMB to give a corrected position provided that the track flown from the DMB to a known position (fix) is relatively short and straight. DMBs should be located as close to the beginning or end of the flight as possible and <u>never</u> while flying a search pattern (except possibly on the first or last leg). By knowing the approximate number of miles flown since the last fix, a percentage navigation error can be obtained. This can then be applied to the corrected DMB position to find a position error for the <u>corrected</u> DMB position. The position error is then applied as the radius of a circle drawn about that point. Drawing such circles around corrected DMB positions will tell the controller whether the DMB positions are accurate enough to yield useful data. If so, maximum and minimum current values can be determined.

EXAMPLE (see Figure 1)

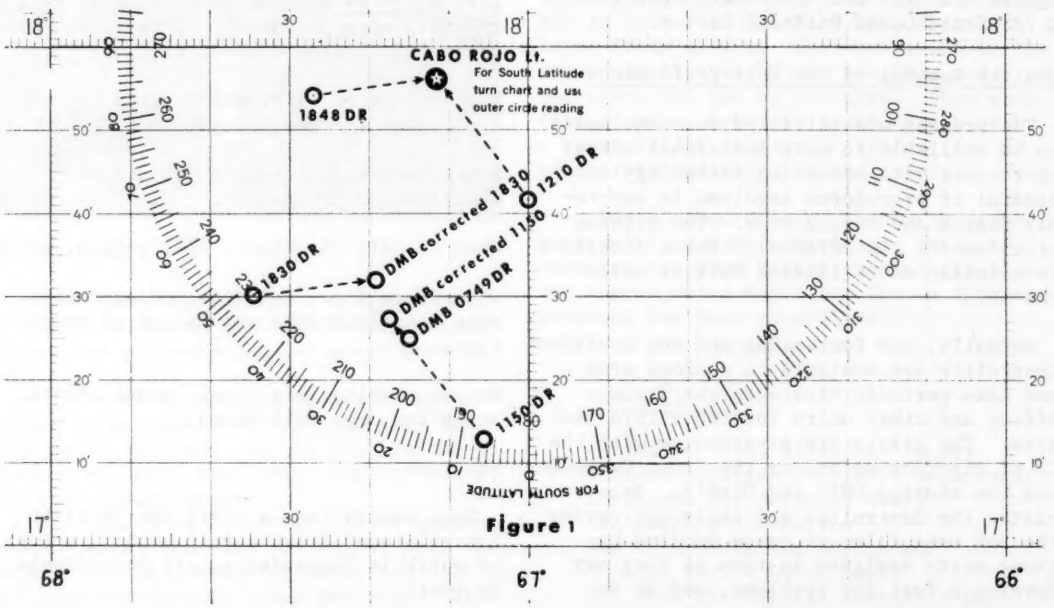


Figure 1

0730 HH3F helicopter obtained visual fix over Cabo Rojo light while enroute to search area A-1.

0749 Helicopter deployed a DMB at dead reckoning position shown and commenced searching area A-1.

1140 Helicopter completed searching area A-1.

1150 Helicopter located DMB at dead reckoning position shown.

1210 Helicopter obtained another visual fix over Cabo Rojo Light. Actual position and dead reckoning position are as shown.

Note: At this point it is possible to approximate the actual DMB positions and position errors as follows:

a. Find the corrected DMB position for 1150 by moving the 1150DR the same distance and direction north and west that it is necessary to move the 1210 DR position to bring it into coincidence with the location of Cabo Rojo Light.

b. Find the navigational error as a percentage of the distance traveled between fixes. Distance traveled is (4.67 hrs) x (100 kts)= 467 miles. At 1210 the DR position was 18 miles from the actual position of the aircraft. Therefore, the percentage error is $\frac{18 \times 100}{467}$ or 3.9% of the DR distance.

c. Find the DMB position error. The distance flown from the DMB at 1150 to Cabo Rojo Light at 1210 is (.33 hrs) x (100 kts) = 33 miles. Applying the navigational error gives (.039) x (33 mi)= 1.3 miles. It can now be said with a great deal of confidence that the DMB at 1150 was somewhere within 1.3 miles of the corrected position. Similarly, the position error for the initial deployment position can also be computed as 1.3 miles, using its distance from the initial fix.

d. Plot the above information on a chart. See Figure 2. The following information can now be obtained:

(1) Minimum current speed 0.18 knots; maximum current speed 1.48 knots.

(2) Minimum (left) current direction 264°; maximum (right) current direction 014°T.

It can easily be seen that, although the accuracy of the DMB current vector is obviously quite limited, it is still much better than using the completely deceptive result that would be obtained if the aircraft's DR positions were used without compensation.

EXAMPLE CONTINUED

1430 A second HH3F helicopter obtained a visual fix while enroute to search area A2.

1830 Helicopter located the DMB in DR position as shown in Figure 1.

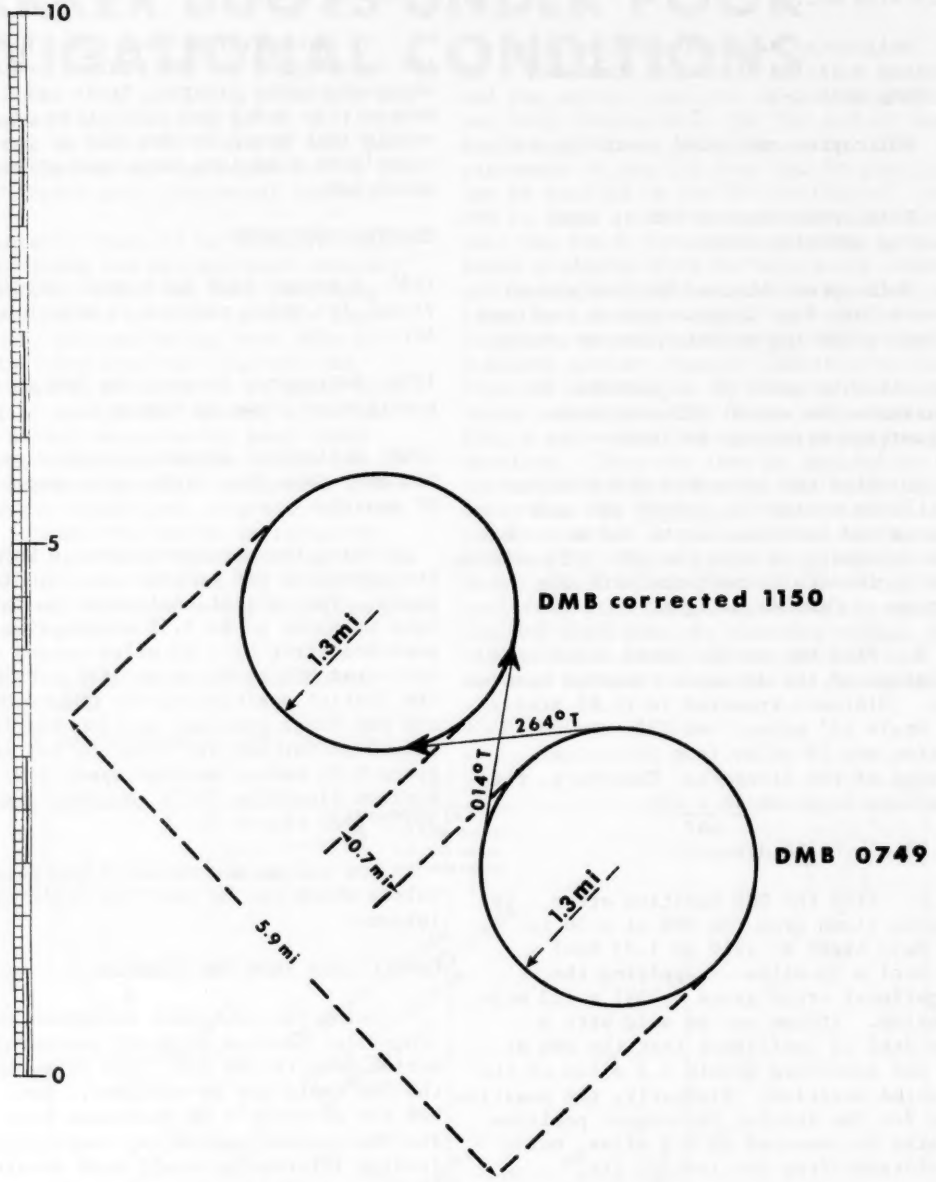
1848 Helicopter obtained another visual fix over Cabo Rojo Light upon completion of search.

Using the same procedure as before, the corrected DMB position at 1830 is found. The navigational error in this case is found to be 3.5% which gives a position error of 1.05 miles around the corrected DMB position at 1830. Using the initial position of the DMB at 0749 and the final position at 1830 the limiting values of current are found to be: minimum speed 0.52 knots, maximum speed 0.97 knots; minimum direction 314°T, maximum direction 349°T (see Figure 3).

The values now obtained are reasonable values which can be used for drift calculations.

CONCLUSIONS FROM THE EXAMPLE

Using the procedure described the RCC controller now has accurate current information despite the fact that fixes over the DMB could not be obtained. Note that, had the aircraft's DR positions been used for DMB current estimates, completely misleading information would have resulted. At least a whole day has been saved in obtaining useful DMB information. Note that this is true in spite of the fact that the navigational errors involved are well below the 5-10% of the DR distance traveled since the last fix that is normally used for aircraft.



Minimum Speed = $\frac{.7 \text{ mi.}}{4 \text{ hrs.}}$ = 0.18 kts. Maximum Speed = $\frac{5.9 \text{ mi.}}{4 \text{ hrs.}}$ = 1.48 kts

Figure 2

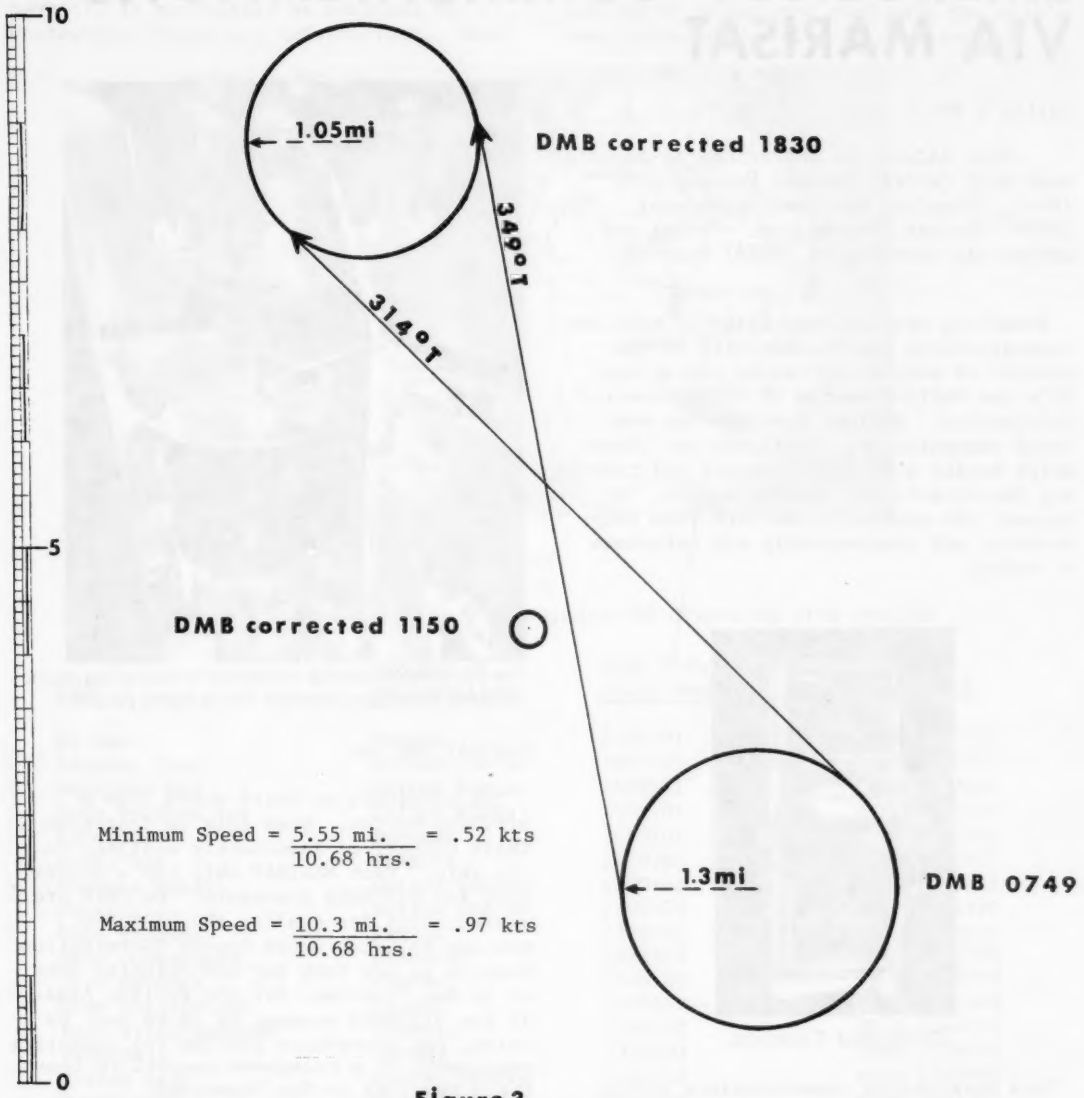


Figure 3

EMERGENCY FLOTATION BAGS (EFBs)

EFBs have been aboard Coast Guard boats for over a year. The EFBs are pillow-shaped inflatable bags which provide emergency buoyancy for sinking boats.

This first year of use was considered an operational evaluation period. Despite a number of problems encountered in the use of the bags, opinion is largely in favor of their continued use.

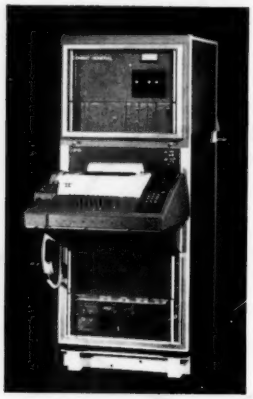
Comments by District Commanders on their units' experience with EFBs and recommendations for improvement of the design are now being considered. It is expected that this field input will lead to a more reliable and more efficient device in the future.

EMERGENCY COMMUNICATIONS VIA MARISAT

Editor's Note:

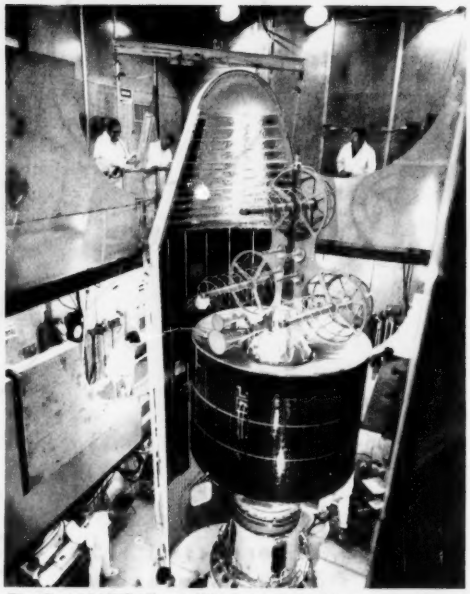
This article is the result of an interview with Captain Charles Dorian, USCG (Ret), Director, Maritime Operations, COMSAT General Corporation. Photos and tables are courtesy of COMSAT General.

Something new has been added to maritime communications and incidentally to the arsenal of search and rescue operations. It's the MARISAT system of COMSAT General Corporation. MARISAT provides the most rapid communications available for those ships having a MARISAT terminal and traveling the Atlantic or Pacific oceans. At present the communications are from ship-to-shore and shore-to-ship via telephone or telex.



Shipboard Terminal

This outstanding communications system is made possible by two specially constructed synchronous satellites, one stationed over the Atlantic Ocean and the other stationed over the Pacific. The one over the Atlantic covers the surface of the earth from the middle of the Gulf of Mexico to the Persian Gulf. The one over the Pacific covers from the west coast of the United States and Mexico to southeast Asia. There are at present 35 ships with MARISAT terminals aboard including some in the oil exploration and drilling business. These are listed on the following pages.



The first MARISAT satellite is enclosed in nose fairing prior to its launch from Cape Canaveral, Florida earlier this year.

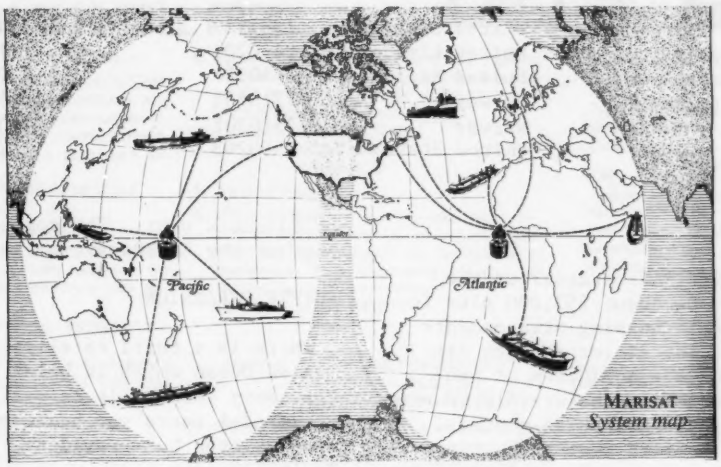
MARISAT AND SAR

The terminals on board ships have a DISTRESS button. When this is depressed a telex circuit is immediately assigned to the ship. Each MARISAT ship has a special card for DISTRESS procedure. On this are instructions for sending the DISTRESS message to Coast Guard Rescue Coordination Centers in New York for the Atlantic Area or in San Francisco for the Pacific Area. If the DISTRESS message is to be sent by voice, the procedures provide for immediate assignment of a telephone channel to Coast Guard New York or San Francisco.

Another obvious use to SAR is the inherent ability of the system to call up specific ships at sea. An RCC Controller who knows from an AMVER plot that a MARISAT equipped ship is near a distressed vessel can call it direct by telex or telephone. The controller would have to indicate an emergency so as to pre-empt any queue that may have formed.

When calling by telex you need to have the ship's telex number. If you don't

have it, it may easily be obtained by contacting "Directory Information". When calling by phone, you need only the ship's name (give number also if you have it).



LIST
OF
SHIPS/OFFSHORE FACILITIES COMMISSIONED FOR OPERATION WITH MARISAT

Ship	Country of Registration	Ship Telephone/ Telex Numbers	Answerback
Al Hasa	Panama	1330701	HCWD 1330701
Alaskan Star	United States	1501577	KGPJ 1501577
American Ace	United States	1500101	KFCV 1500101
Arco Prudhoe Bay	United States	1501101	KPFD 1501101
Atrevida	Denmark	2610101	OVRZ 2610101
Bamse Dan	Denmark	2610201	OXYL 2610201
Chevron Hawaii	United States	1500401	KNFD 1500401
Crest	United States	1501576	WBGF 1501576
Esso Bangkok	Panama	1330101	HPXD 1330101
Esso Copenhagen	Liberia	1240102	ELSJ 1240102
Esso Malacca	Panama	1330102	HPDA 1330102
Esso Philippines	Panama	1330103	HPXW 1330103
Esso Wilhelmshaven	Liberia	1240101	ELVX 1240101
Ferncraig	Norway	2310401	LMDG 2310401
Golden Bear	United States	1500501	WEZD 1500501
Hurricane	United States	1501301	KOGL 1501301
Indus	Sweden	2370101	SLAT 2370101
Italica	Italy	2150101	IBKL 2150101
KDD Maru	Japan	3203177	JGOC 3203177
Kurama-Maru	Japan	3200102	JDDG 3200102
Lash Atlantico	United States	1500201	WEZU 1500201
John A. MacDonald	Canada	1560101	CGBK 1560101
Mercury	United Kingdom	2440101	GJXH 2440101
Messiniaki Chara	Greece	2130101	SXRN 2130101
Mobil Aero	United States	1500601	WLBY 1500601
Mormacstar	United States	1500301	KGDF 1500301
Nopal Branco	Norway	2310201	LAHW 2310201
Ocean Ranger	Panama	1330702	HENB 1330702
U.S. Olympic	United States	1503216	WYZQ 1503216

Ship	Country of Registration	Ship Telephone/ Telex Numbers	Answerback
Pacesetter III	United States	1501477	WDBT 1501477
Post Enterprise	United Kingdom	2440201	GUHL 2440201
Queen Elizabeth 2	United Kingdom	2440301	GBTT 2440301
Royal Viking Sea	Norway	2310101	LECK 2310101
Toyama	Norway	2310301	LIAT 2310301
Lash Turkiye	United States	1500203	WMIG 1500203

COSTS AND CHARGES

A shipboard MARISAT terminal at the present time costs about $53,000 plus installation costs. Leasing arrangements are also available. Telex charges are $6.00 per minute for a minimum of one minute. Telephone charges are $10.00 per minute for a minimum of three minutes. It is of interest to note that some ships have sent AMVER messages by satellite even though they have to pay charges this way. A suggestion was made to the effect that a ship sending telex traffic to its company could easily tack its AMVER message on to the end of the company traffic at little or no extra cost. The company could then forward the AMVER part to the AMVER Center.

FUTURE EXPANSION

There is a third satellite over the Indian Ocean which is being used only by U.S. Navy ships. It is not available to commercial users yet because no country in that area has provided a ground station. It is foreseen that, when some country does provide a station, the three satellites could be rearranged so that gaps would be filled and coverage could be maintained around the world.

MARISAT SHORE TO SHIP TELEX CALLS
VIA COMSAT GENERAL ON WESTERN UNION TELEX
DIAL 107 TOLL FREE

TO PLACE A CALL

1. Press START button and hold for DIAL light.
2. Dial 107 for toll free access to COMSAT General. Your machine will print the COMSAT General Identification, message sequence numbers, month, day and time, followed by your own answerback. Dial light will extinguish, CONN light will turn on.
   Example: **COMGEN 00066 02/19 1201Z ⊠**
   X-RAY HOU
3. Type the proper ocean code: (FIGS) 805 for the Atlantic and western Indian Ocean, and (FIGS) 705 for the Pacific. Type the MARISAT telex number of the ship you wish to call, followed by a quotation mark (SHIFT) (") (upper case Z key).
   Example: **8051503177" or 7051503177"**
4. Upon connection with your party, your machine will print month, day, year and time and your party's answerback. Press HERE IS key to transmit your own answerback.
   Example: **02/19/76 1202Z**
   KCGC 1503177
   X-RAY HOU
5. Transmit Text.
6. When transmission is completed, type (FIGS) D to receive your party's answerback.
   Example: **KCGC 1503177**
7. To be disconnected, press the STOP button until CONN light extinguishes

OR

Type five periods to receive date/time and chargeable minutes

Example: .....
02/19/76 1206Z 003.6 MIN

OR

To place another call type five commas. You will receive the chargeable minutes for the last call, new COMSAT General response and your answerback.

Example: , , , , ,
02/19/76 1206Z 003.6 MIN
COMGEN 00067 02/19 1206Z ⊠
X-RAY HOU

8. If call cannot be completed, COMSAT General's AUTO-RETRY will automatically retry your number. When you receive your party's answerback, proceed from Step 5.
   Example: **OCC RETRYING or**
   NC RETRYING

   If AUTO-RETRY cannot make the connection, you will automatically be given the option to select store and forward service after your printer prints STORE AND FORWARD? (COMSAT General's store and forward service is called MARITRAN.)
   Example: **NC RETRY ENDS.**
   STORE AND FORWARD?

   If store and forward service is desired type Y. The system will ask for your telex number and message text.
   Example: **STORE AND FORWARD? Y**
   MARITRAN—PLS TYPE
   YOUR OWN NBR—THEN TEXT

   If store and forward service is not desired type N (system will time-out and disconnect after 5 seconds if no response). You will receive a new COMSAT General response followed by your answerback. Proceed from Step 3 to enter a new selection or disconnect as in Step 7.
   Example: **STORE AND FORWARD? N**
   COMGEN 00068 02/19 1202Z ⊠
   X-RAY HOU

OPERATOR ASSISTANCE 10"

If you reach a wrong MARISAT number or are cut off or experience poor transmission, dial 107 toll free for access to COMSAT General. After CONN light turns on and after receipt of COMSAT General identification and your own answerback, type (FIGS) 10" for operator assistance.

Example: **COMGEN 00066 02/19 1201Z ⊠**
X-RAY HOU
10" COMGEN OPR ASST ⊠
X-RAY HOU

DIRECTORY INFORMATION 19"

To obtain the MARISAT telex number of a ship, dial 107 toll free for access to COMSAT General. After CONN light turns on and after receipt of COMSAT General identification and your own answerback, type (FIGS) 19" for directory information.

Example: **COMGEN 00066 02/19 1201Z ⊠**
X-RAY HOU
19" COMGEN OPR INFO ⊠
X-RAY HOU

MARISAT SHORE TO SHIP TWX CALLS

VIA COMSAT GENERAL ON WESTERN UNION TWX

DIAL 710-581-5920 TOLL FREE

1. Press ORIG button. Listen for dial tone.
2. Dial 710-581-5920 for toll free access to COMSAT General. After you hear a short tone, your machine will print the COMSAT General identification, message sequence number, month, day and time followed by your own answerback.
   Example: **COMGEN 00066 02/19 1201Z**
   X-RAY HOU
3. Type the proper ocean code: 805 for the Atlantic and the western Indian Ocean, 705 for the Pacific, and the MARISAT telex number of the ship you wish to call, followed by a plus sign (SHIFT) (+).
   Example: **8051503177+ or 7051503177+**
4. Upon connection with your party, your machine will print month, day, year, and time and your party's answerback. Press HERE IS key to transmit your own answerback.
   Example: **02/19/76 1201Z**
   KCGC 1503177
   X-RAY HOU
5. Transmit Text.
6. When transmission is completed, press (CTRL) and (WRU) keys to receive your party's answerback, which serves as confirmation of connection. Do not disconnect until after you receive your party's answerback.
   Example: **KCGC 1503177**
7. To be disconnected, press the CLR button until ORIG light extinguishes OR

   Type five periods to receive date/time and chargeable minutes
   Example: .....
   02/19/76 1206Z 003.6 MIN
   OR
   To place another call type five commas. You will receive the chargeable minutes for the last call, new COMSAT General response, and your answerback.
   Example: ,,,,,
   02/19/76 1206Z 003.6 MIN
   COMGEN 00067 02/19 1206Z
   X-RAY HOU
8. If call cannot be completed, COMSAT General's AUTO-RETRY will automatically retry your number. When you receive your party's answerback, proceed from Step 5.
   Example: **OCC RETRYING or**
   NC RETRYING

   If AUTO-RETRY cannot make the connection, you will automatically be given the option to select store and forward service after your printer prints STORE AND FORWARD? (COMSAT General's store and forward service is called MARITRAN.)
   Example: **NC RETRY ENDS**
   STORE AND FORWARD?

   If store and forward service is desired type Y. The system will ask for your telex number and message text.
   Example: **STORE AND FORWARD? Y**
   MARITRAN — PLS TYPE
   YOUR OWN NBR — THEN TEXT

   If store and forward service is not desired type N (system will time-out and disconnect after 5 seconds if no response). You will receive a new COMSAT General response followed by your answerback. Proceed from Step 3 to enter a new selection or disconnect as in Step 7.
   Example: **STORE AND FORWARD? N**
   COMGEN 00068 02/19 1202Z
   X-RAY HOU

OPERATOR ASSISTANCE 10+

If you reach a wrong MARISAT number or are cut off or experience poor transmission, dial 710-581-5920 toll free for access to COMSAT General. After you hear a short tone and after receipt of COMSAT General identification and your own answerback, type 10+ for operator assistance.
Example: **COMGEN 00066 02/19 1201Z**
X-RAY HOU
10+ COMGEN OPR ASST
X-RAY HOU

DIRECTORY INFORMATION 19+

To obtain the MARISAT telex number of a ship, dial 710-581-5920 toll free for access to COMSAT General. After you hear a short tone and after receipt of COMSAT General identification and your own answerback, type 19+ for directory information.
Example: **COMGEN 00066 02/19 1201Z**
X-RAY HOU
19+ COMGEN OPR INFO
X-RAY HOU

MARISAT SHORE TO SHIP TELEPHONE CALLS

These procedures apply to telephone calls originating from any telephone within the 48 contiguous States and the District of Columbia via COMSAT General.

1. For calls to ships or offshore facilities in the Ocean Regions listed below, dial the COMSAT General MARISAT Operator toll free as follows:
   - Atlantic and Western Indian Oceans 800-243-3640 all states except Connecticut (Connecticut call collect 203-264-9090).
   - Pacific 800-235-5969 all states except California (California call collect 805-525-8333).
2. Tell operator the MARISAT ship name and number, whether person-to-person or station-to-station, and whether you wish time and charges. Be prepared to tell operator your own telepone area code and number.
3. The operator will call you back when the connection is made.

   (Collect, coin-operated phones, credit card or third party billing will not be accepted.)

OPERATOR ASSISTANCE
Call your MARISAT Operator toll free, as above.

Facsimile and data communications at 1,200 or 2,400 bits per second utilizing each satellite's voice channel are also available. To ensure end-to-end compatability interface specifications and data channel characteristics should be coordinated with COMSAT General's Maritime Customer Service Requirements Manager at telephone 202-554-6090 or telex 89-2343.

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A: v(6);u(5);abcdefghmn(3);ijkly(2);prs(1)
B: g(40);ce(25);fhn(10);b(5);ij(3);dkm(2);lopqst(1)
C: a(5);bd(3);ot(2);efghijmnprsuw(1)
D: ltuvx(2);adgijknoqyz(1)
E: n(1)
F: bcjkmp(1)
List CG-8
List CG-39